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2 **CLAIMS**
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4 **1.** A web content adaptation method comprising:
5 analyzing one or more functions associated with a webpage; and
6 adapting the webpage for presentation on a device based on said analyzing.
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8 **2.** The method of claim 1, wherein said analyzing comprises generating
9 one or more function-based object models that represent objects comprising the
10 webpage.
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12 **3.** The method of claim 2, wherein said generating comprises:
13 identifying one or more basic objects associated with the webpage, basic
14 objects comprising a smallest information body that cannot be further divided; and
15 identifying one or more composite objects associated with the webpage,
16 composite objects comprising objects that contain other objects.
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18 **4.** The method of claim 1, wherein said adapting comprises doing so in
19 view of one or more networking conditions.
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21 **5.** The method of claim 1, wherein said adapting comprises doing so in
22 view of one or more user preferences.
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1 6. A web content adaptation method comprising:
2 analyzing one or more functions associated with a webpage that is
3 configured for presentation within a first client environment; and
4 based on said analyzing, adapting the webpage for presentation within a
5 second client environment that is different from the first client environment.

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7 7. The method of claim 6, wherein said analyzing comprises generating
8 one or more function-based object models that represent objects comprising the
9 webpage.

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11 8. The method of claim 7, wherein said generating comprises:
12 identifying one or more basic objects associated with the webpage, basic
13 objects comprising a smallest information body that cannot be further divided; and
14 identifying one or more composite objects associated with the webpage,
15 composite objects comprising objects that contain other objects.

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17 9. The method of claim 8, wherein said generating further comprises
18 generating said one or more function-based object models as a function of
19 properties that are associated with said one or more basic objects and said one or
20 more composite objects.

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22 10. The method of claim 9, wherein said adapting comprises applying
23 one or more rules to said one or more function-based object models.
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1 **11.** The method of claim 6, wherein said first and second client
2 environments pertain to different client devices.

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4 **12.** The method of claim 6, wherein said first and second client
5 environments pertain to different types of client devices.

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7 **13.** The method of claim 6, wherein said first and second client
8 environments pertain to different network conditions.

9
10 **14.** The method of claim 6, wherein said first and second client
11 environments pertain to different user preferences.

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13 **15.** One or more computer-readable media having computer-readable
14 instructions thereon which, when executed by one or more processors, cause the
15 one or more processors to implement the method of claim 6.

1 16. A web content adaptation method comprising:

2 analyzing one or more functions associated with a webpage that is
3 configured for presentation on a first device type, said analyzing being performed
4 by generating one or more function-based object models that represent objects
5 comprising the webpage,

6 said objects comprising:

7 one or more basic objects associated with the webpage, basic
8 objects comprising a smallest information body that cannot be
9 further divided, said one or more basic objects being configured to
10 perform one or more of the following functions: (1) providing
11 semantic information, (1) navigating to other objects, (3) providing a
12 visual effect on the webpage, and (4) enabling user interaction; and

13 one or more composite objects associated with the webpage,
14 composite objects comprising objects that contain other objects, said
15 one or more composite objects having a clustering function that is
16 associated with a webpage author's intention; and

17 based on said analyzing, adapting the webpage for presentation on a second
18 device type that is different from the first device type.

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20 17. The method of claim 16, wherein said generating of the one or more
21 function-based object models comprises generating multiple function-based object
22 models each of which being generated as a function of multiple different
23 properties that can be associated with associated objects.
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1 **18.** The method of claim 16, wherein said generating of the one or more
2 function-based object models comprises generating at least one function-based
3 object model for a basic object, said at least one function-based object model
4 being generated as a function of one or more of the following properties: (1) a
5 presentation property that defines a way in which the object is presented, (2) a
6 semanteme property associated with content of an object, (3) a decoration property
7 pertaining to an extent to which the basic objects serves to decorate the webpage,
8 (4) a hyperlink property pertaining to an object to which the basic object points via
9 a hyperlink, and (5) a interaction property pertaining to an interaction method of
10 the basic object.

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12 **19.** The method of claim 16, wherein said generating of the one or more
13 function-based object models comprises generating at least one function-based
14 object model for a composite object, said at least one function-based object model
15 being generated as a function of one or more of the following properties: (1) a
16 clustering relationship property pertaining to a relationship among root children of
17 the composite object, and (2) a presentation relationship property pertaining to a
18 presentation order associated with the root children of the composite object.

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20 **20.** The method of claim 16, wherein said generating of the one or more
21 function-based object models comprises generating at least one specific function-
22 based object model that serves to categorize an object.
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1 **21.** The method of claim 20, wherein said generating of said at least one
2 specific function-based object model comprises, for a basic object, generating said
3 at least one specific function-based object model based upon properties of the
4 basic object and properties associated with any father or brother objects.
5

6 **22.** The method of claim 20, wherein said generating of said at least one
7 specific function-based object model comprises, for a composite object, generating
8 said at least one specific function-based object model based upon properties of the
9 composite object and any of its root children.
10

11 **23.** The method of claim 20, wherein said generating of said at least one
12 specific function-based object model comprises using a rule-based decision tree to
13 ascertain a category of an object.
14

15 **24.** The method of claim 16, wherein said adapting comprises applying
16 one or more rules to said function-based object models.
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18 **25.** One or more computer-readable media having computer-readable
19 instructions thereon which, when executed by one or more processors, cause the
20 one or more processors to implement the method of claim 16.
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1 **26.** A web content adaptation method comprising:

2 analyzing one or more functions associated with a webpage by generating
3 one or more function-based object models that represent objects comprising the
4 webpage,

5 said objects comprising:

6 one or more basic objects associated with the webpage, basic
7 objects comprising a smallest information body that cannot be
8 further divided, said one or more basic objects being configured to
9 perform one or more of the following functions: (1) providing
10 semantic information, (1) navigating to other objects, (3) providing a
11 visual effect on the webpage, and (4) enabling user interaction; and

12 one or more composite objects associated with the webpage,
13 composite objects comprising objects that contain other objects, said
14 one or more composite objects having a clustering function that is
15 associated with a webpage author's intention; and

16 based on said analyzing, adapting the webpage for presentation on a device.
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18 **27.** The method of claim 26, wherein said adapting comprises doing so
19 in view of one or more networking conditions.
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21 **28.** The method of claim 26, wherein said adapting comprises doing so
22 in view of one or more user preferences.
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1 **29.** One or more computer-readable media having computer-readable
2 instructions thereon which, when executed by one or more processors, cause the
3 one or more processors to:

4 analyze one or more functions associated with a webpage that is configured
5 for presentation on a first device type by generating one or more function-based
6 object models that represent objects comprising the webpage,

7 said objects comprising:

8 one or more basic objects associated with the webpage, basic
9 objects comprising a smallest information body that cannot be
10 further divided, said one or more basic objects being configured to
11 perform one or more of the following functions: (1) providing
12 semantic information, (1) navigating to other objects, (3) providing a
13 visual effect on the webpage, and (4) enabling user interaction; and

14 one or more composite objects associated with the webpage,
15 composite objects comprising objects that contain other objects, said
16 one or more composite objects having a clustering function that is
17 associated with a webpage author's intention;

18 said generating of the one or more function-based object models
19 comprising generating at least one function-based object model for a basic
20 object, said at least one function-based object model being generated as a
21 function of one or more of the following properties: (1) a presentation
22 property that defines a way in which the object is presented, (2) a
23 semanteme property associated with content of an object, (3) a decoration
24 property pertaining to an extent to which the basic objects serves to
25 decorate the webpage, (4) a hyperlink property pertaining to an object to

1 which the basic object points via a hyperlink, and (5) a interaction property
2 pertaining to an interaction method of the basic object;

3 said generating further comprising generating at least one function-
4 based object model for a composite object, said at least one function-based
5 object model for the composite object being generated as a function of one
6 or more of the following properties: (1) a clustering relationship property
7 pertaining to a relationship among root children of the composite object,
8 and (2) a presentation relationship property pertaining to a presentation
9 order associated with the root children of the composite object;

10 said generating further comprising generating at least one specific
11 function-based object model that serves to categorize an object by:

12 for a basic object, generating said at least one specific
13 function-based object model based upon properties of the basic object and
14 properties associated with any father or brother objects; and

15 for a composite object, generating said at least one specific
16 function-based object model based upon properties of the composite object
17 and any of its root children; and

18 based upon an analysis of said one or more functions, adapt the webpage
19 for presentation on a second device type that is different from the first device type.

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21 **30.** The one or more computer-readable media of claim 29, wherein said
22 instructions cause the one or more processors to adapt the webpage for
23 presentation on a WAP-enabled device.
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1 **31.** A web content adaptation method comprising:
2 receiving multiple web pages that are configured for display on a first
3 device type;
4 processing the multiple web pages to provide multiple different objects
5 associated with the webpages, individual objects having one or more properties
6 relating to functions of the individual object;
7 applying one or more rules to the objects sufficient to provide multiple
8 different webpages that are configured for display on a second device type that is
9 different from the first device type.

10
11 **32.** The method of claim 31, wherein the individual objects can have a
12 presentation property that defines a way in which the object is presented.

13
14 **33.** The method of claim 31, wherein the individual objects can have a
15 semanteme property associated with the content of an object.

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17 **34.** The method of claim 31, wherein the individual objects can have a
18 decoration property pertaining to the extent to which an object serves to decorate a
19 webpage.

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21 **35.** The method of claim 31, wherein the individual objects can have a
22 hyperlink property pertaining to an object to which another object points via a
23 hyperlink.

1 **36.** The method of claim 31, wherein the individual objects can have a
2 interaction property pertaining to an interaction method of an object.

3
4 **37.** The method of claim 31, wherein the individual objects can have a
5 clustering relationship property pertaining to a relationship among any root
6 children of an object.

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8 **38.** The method of claim 31, wherein the individual objects can have a
9 presentation relationship property pertaining to a presentation order associated
10 with any root children of an object.

11
12 **39.** The method of claim 31, wherein said processing comprises
13 defining a representation of an object that includes any children of said object.

14
15 **40.** The method of claim 31, wherein said processing comprises
16 assigning a category to one or more objects.

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18 **41.** The method of claim 40, wherein said assigning comprises using a
19 rule-based decision tree to ascertain a category for said one or more objects.
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1 **42.** The method of claim 40, wherein said assigning comprises
2 assigning a category from a set of object categories comprising: (1) an information
3 object that presents content information, (2) a navigation object that provides a
4 navigation function, (3) an interaction object that provides for user interaction, (4)
5 a decoration object that serves a decoration function, (5) a special function object
6 that performs a defined function, and (6) a page object that is associated with
7 presentation of related information.

8
9 **43.** A web content adaptation method that adapts web content from one
10 format to another, and which uses multiple function-based object models to do so,
11 where the function-based object models comprise models that pertain to (1) basic
12 objects that comprise a smallest information body that cannot be further divided,
13 and (2) composite objects that comprise objects that can contain other objects.

14
15 **44.** The web content adaptation method of claim 43, wherein the
16 function-based object models are generated as a function of one or more properties
17 associated with the objects.

18
19 **45.** A system for adapting web content from one format to another
20 comprising one or more function-based object models, individual function-based
21 object models representing objects that are present in a webpage in terms of one or
22 more of an object's functional properties.

1 **46.** The system of claim 45, wherein one of the properties comprises a
2 presentation property that defines a way in which the object is presented.

3
4 **47.** The system of claim 45, wherein one of the properties comprises a
5 semanteme property associated with the content of an object.

6
7 **48.** The system of claim 45, wherein one of the properties comprises a
8 decoration property pertaining to the extent to which an object serves to decorate a
9 webpage.

10
11 **49.** The system of claim 45, wherein one of the properties comprises a
12 hyperlink property pertaining to an object to which another object points via a
13 hyperlink.

14
15 **50.** The system of claim 45, wherein one of the properties comprises a
16 interaction property pertaining to an interaction method of an object.

17
18 **51.** The system of claim 45, wherein one of the properties comprises a
19 clustering relationship property pertaining to a relationship among any root
20 children of an object.

21
22 **52.** The system of claim 45, wherein one of the properties comprises a
23 presentation relationship property pertaining to a presentation order associated
24 with any root children of an object.

1 **53.** Software code embodied on a computer-readable medium that
2 implements the system of claim 45.

3
4 **54.** A computer architecture for use in adapting web content for display
5 on a computing device, the architecture comprising:

6 an analysis module for receiving at least one webpage and processing the
7 one webpage to produce one or more function-based object models that describe
8 functional properties of objects that are contained in the one webpage;

9 one or more rules modules that contain rules that are to be used to adapt
10 content contained in the webpage; and

11 a content adaptation module configured to process the one or more
12 function-based object models in accordance with one or more rules contained in
13 the one or more rules modules to produce a new web page that has been adapted
14 from the one web page.

15
16 **55.** The computer architecture of claim 54, wherein the content
17 adaptation module is configured to produce a new web page for display on a
18 WAP-enabled device.

19
20 **56.** The computer architecture of claim 54, wherein said analysis
21 module is configured to produce function-based object models that pertain to both
22 basic objects and composite objects,

23 basic objects comprising a smallest information body that cannot be further
24 divided; and

25 composite objects comprising objects that contain other objects.

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2 **57.** The computer architecture of claim 56, wherein said analysis
3 module is configured to produce, for basic objects, function-based object models
4 that comprise values associated with the following properties: (1) a presentation
5 property that defines a way in which the object is presented, (2) a semanteme
6 property associated with content of an object, (3) a decoration property pertaining
7 to an extent to which the basic objects serves to decorate the webpage, (4) a
8 hyperlink property pertaining to an object to which the basic object points via a
9 hyperlink, and (5) a interaction property pertaining to an interaction method of the
10 basic object.

11
12 **58.** The computer architecture of claim 56, wherein said analysis
13 module is configured to produce, for composite objects, function-based object
14 models that comprise values associated with the following properties: (1) a
15 clustering relationship property pertaining to a relationship among root children of
16 the composite object, and (2) a presentation relationship property pertaining to a
17 presentation order associated with the root children of the composite object.
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